IN THE CLAIMS

CLAIM 1 (Original) A memory storage device comprising:

a) a storage cell comprising a changeable magnetic region, said changeable magnetic region comprising a material having a magnetization state that is responsive to a change in temperature thereof; and

b) a heating element proximate to said storage cell for selectively changing the temperature of said changeable magnetic region of said storage cell.

CLAIM 2 (Original) The memory storage device of claim 1, wherein said storage cell comprises a magnetic tunnel junction.

CLAIM 3 (Original) The memory storage device of claim 1, wherein said changeable magnetic region is a reversible magnetic region having a magnetization state which can be reversed by applying thereto a selected magnetic field, said reversible magnetic region comprising a material having a magnetization state that is responsive to a change in the temperature thereof.

CLAIM 4 (Original) The memory storage device of claim 3, wherein said storage cell further comprises at least one fixed magnetic region having a magnetization state which does not reverse when said selected magnetic field is applied thereto.

CLAIM 5 (Original) The memory storage device of claim 1, wherein said heating element is heated by passing an electric current therethrough.

CLAIM 6 (Original) The memory storage device of claim 5, further comprising an electrically conductive terminal capable of receiving the electric current passing through said heating element.

CLAIM 7 (Original) The memory storage device of claim 1, wherein said material having a magnetization state that is responsive to a change in temperature thereof comprises a ferrimagnetic material.

CLAIM 8 (Original) The memory storage device of claim 7, wherein said changeable magnetic region is maintained at a compensation temperature of said material to maintain stored data in said storage cell.

CLAIM 9 (Original) A memory storage device comprising:

a) a storage cell comprising a changeable magnetic region, said changeable magnetic region comprising a material having a magnetization state that is responsive to a change in temperature thereof; and

b) a heating element responsive to an external energy source and proximate to said storage cell for selectively changing the temperature of said changeable magnetic region of said storage cell.

CLAIM 10 (Original) A memory array comprising two or more memory storage devices, at least one of said memory storage devices comprising:

a) a storage cell having a bit line and word line associated therewith, said storage cell comprising a changeable magnetic region, said changeable magnetic region comprising a material having a magnetization state that is responsive to a change in temperature thereof; and

b) a heating element proximate to said storage cell for selectively changing the temperature of said changeable magnetic region of said storage cell.

CLAIM 11 (Original) The memory array of claim 10, wherein said storage cell comprises a magnetic tunnel junction.

CLAIM 12 (Original) The memory array of claim 10, wherein said changeable magnetic region is a reversible magnetic region having a magnetization state which can be reversed by applying thereto a selected magnetic field, said reversible magnetic region comprising a material having a magnetization state that is responsive to a change in temperature thereof.

CLAIM 13 (Original) The memory array of claim 12, wherein said storage cell further comprises at least one fixed magnetic region having a magnetization state which does not reverse when said selected magnetic field is applied thereto.

CLAIM 14 (Original) The memory array of claim 10, wherein said heating element is heated by passing an electric current therethrough.

CLAIM 15 (Original) The memory array of claim 14, wherein said at least one of said memory storage devices further comprises an electrically conductive terminal capable of receiving the electric current passing through said heating element.

CLAIM 16 (Original) The memory array of claim 14, wherein said electric current is passed through said heating element for a predetermined time period, wherein said time period is sufficiently short so as to prevent reversal of a magnetization state of one or more storage cells adjacent to the selected storage cell.

CLAIM 17 (Original) The memory array of claim 10, wherein said material having a magnetization state that is responsive to a change in temperature thereof comprises a ferrimagnetic material.

CLAIM 18 (Original) The memory array of claim 10, wherein said changeable magnetic region is maintained at a compensation temperature of said material to maintain stored data in said storage cell.

CLAIM 19 (Original) An integrated circuit comprising at least one memory storage device, said memory storage device comprising:

a) a storage cell comprising a changeable magnetic region, said changeable magnetic region comprising a material having a magnetization state that is responsive to a change in temperature thereof; and

b) a heating element proximate to said storage cell for selectively changing the temperature of said changeable magnetic region of said storage cell.

CLAIM 20 (Original) The integrated circuit of claim 19, wherein said at least one memory storage device further comprises an electrically conductive terminal capable of receiving an electric current passing through said heating element.

CLAIM 21 (New) A method for writing to a memory storage device comprising:

a) providing a storage cell comprising a changeable magnetic region, said changeable magnetic region comprising a material having a magnetization state that is responsive to a change in temperature thereof; and

b) heating an element proximate to said storage cell for selectively changing the temperature of said changeable magnetic region of said storage cell.

CLAIM 22 (New) A method according to 21, wherein said storage cell comprises a magnetic tunnel junction.

CLAIM 23 (New) A method according to claim 1, wherein said changeable magnetic region is a reversible magnetic region having a magnetization state which can be reversed by applying thereto a selected magnetic field, said reversible magnetic region comprising a material having a magnetization state that is responsive to a change in the temperature thereof.

CLAIM 24 (New) A method according to claim 23, wherein said storage cell further comprises at least one fixed magnetic region having a magnetization state which does not reverse when said selected magnetic field is applied thereto.

CLAIM 25 (New) A method according to claim 21, wherein said heating said element is heated by passing an electric current therethrough.

CLAIM 26 (New) A method according to claim 25, further comprising providing an electrically conductive terminal capable of receiving the electric current passing through said heating element.

CLAIM 27 (New) A method according to claim 21, wherein said material having a magnetization state that is responsive to a change in temperature thereof comprises a ferrimagnetic material.

CLAIM 28 (New) A method according to claim 27, further comprising maintaining said changeable magnetic region at a compensation temperature of said material to maintain stored data in said storage cell.

CLAIM 29 (New) A method for writing to a memory storage device comprising:

a) providing a storage cell comprising a changeable magnetic region, said changeable magnetic region comprising a material having a magnetization state that is responsive to a change in temperature thereof; and

b) heating an element responsive to an external energy source and proximate to said storage cell for selectively changing the temperature of said changeable magnetic region of said storage cell.

CLAIM 30 (New) A method for writing to a memory storage device comprising a memory array comprising two or more memory storage devices, said method comprising:

a) providing a storage cell having a bit line and word line associated therewith, said storage cell comprising a changeable magnetic region, said changeable magnetic region comprising a material having a magnetization state that is responsive to a change in temperature thereof; and

b) heating an element proximate to said storage cell for selectively changing the temperature of said changeable magnetic region of said storage cell.

CLAIM 31 (New) A method according to claim 30, wherein said storage cell comprises a magnetic tunnel junction.

CLAIM 32 (New) A method according to 30, wherein said changeable magnetic region is a reversible magnetic region having a magnetization state which can be reversed by applying thereto a selected magnetic field, said reversible magnetic region comprising a material having a magnetization state that is responsive to a change in temperature thereof.

CLAIM 33 (New) A method according to claim 32, further comprising providing at least one fixed magnetic region having a magnetization state which does not reverse when said selected magnetic field is applied thereto.

CLAIM 34 (New) A method according to 30, wherein said heating said element is provided by passing an electric current through said element.

CLAIM 35 (New) A method according to claim 34, wherein said at least one of said memory storage devices further comprises an electrically conductive terminal capable of receiving the electric current passing through said heating element.

CLAIM 36 (New) A method according to 34, wherein said passing said electric current through said heating element is for a predetermined time period, wherein said time period is sufficiently short so as to prevent reversal of a magnetization state of one or more storage cells adjacent to the selected storage cell.

CLAIM 37 (New) A method according to claim 30, wherein said material having a magnetization state that is responsive to a change in temperature thereof comprises a ferrimagnetic material.

CLAIM 38 (New) A method according to claim 30, wherein said changeable magnetic region is maintained at a compensation temperature of said material to maintain stored data in said storage cell.

CLAIM 39 (New) A method for writing to a memory storage device on an integrated circuit comprising at least one memory storage device, said method comprising:

a) providing a storage cell comprising a changeable magnetic region, said changeable magnetic region comprising a material having a magnetization state that is responsive to a change in temperature thereof; and

b) heating an element proximate to said storage cell for selectively changing the temperature of said changeable magnetic region of said storage cell.

CLAIM 40 (New) A method according to claim 13, wherein said at least one memory storage device further comprises an electrically conductive terminal capable of receiving an electric current passing through said heating element.

CLAIM 41 (New) A method of writing to a magnetic memory element, the method comprising: heating the memory element; and applying at least one magnetic field to the memory element.

CLAIM 42 (New) The method of claim 41, wherein the heat and at least one magnetic field are applied to the memory element simultaneously.

CLAIM 43 (New) The method of claim 41, wherein heat is applied and removed before at least one magnetic field is applied to the memory element.

CLAIM 44 (New) The method of claim 41, wherein the heating raises the temperature of the memory element by about 5 C^0 to 10 C^0 above a compensation temperature.

CLAIM 45 (New) The method of claim 41, wherein the heating raises the temperature of the memory element.

CLAIM 46 (New) The method of claim 41, wherein the junction is heated by passing a current through a conductor .

CLAIM 47 (New) The method of claim 41, wherein first and second orthogonal fields are applied to the memory element.

CLAIM 48 (New) An information storage device comprising: an array of magnetic memory elements; and a plurality of heating elements for the memory elements.

CLAIM 49 (New) The device of claim 48, wherein the heating elements are conductors.

CLAIM 50 (New) The device of claim 48, wherein the heating elements are included in said devices extending across the array.

CLAIM 51 (New) The device of claim 50, wherein each heating element includes conductors providing the heating elements.

CLAIM 52 (New) The device of claim 50, wherein the heating lines extend diagonally across the array.

CLAIM 53 (New) The device of claim 48, wherein the heating elements raise the temperature of selected memory elements by about 5 C^0 to 10 C^0 above a compensation temperature.

CLAIM 54 (New) The device of claim 48, wherein the heating elements raise the temperature of selected memory elements.

CLAIM 55 (New) The device of claim 48, further comprising first means for generating magnetic fields for switching selected memory elements; and second means for causing the heating elements to apply heat to the selected memory elements while the magnetic fields are being applied.

CLAIM 56 (New) The device of claim 48, further comprising first means for generating magnetic fields for switching selected memory elements; and second means for causing the heating elements to apply heat to the selected memory elements before the magnetic fields are applied.

CLAIM 57 (New) An information storage device comprising: an array of magnetic memory elements; and means for performing thermally-assisted switching of selected memory elements in the array.

CLAIM 58 (New) The method of claim 41, wherein the junction is heated by passing a current through a conductor that is spaced apart from the junction.

CLAIM 59 (New) The method of claim 41, wherein first and second orthogonal fields are applied to the memory element.

CLAIM 60 (New) The device of claim 48, wherein the heating elements are spaced apart from the memory elements.